

In the Claims:

1. (Currently Amended) An apparatus for controlling a plurality of speakers to play in a multi-channel audio system, wherein the plurality of speakers are arranged at respective positions within a listening area, the apparatus comprising:

an amplifier for amplifying multi-channel audio signals to be played over the plurality of speakers; and

at least one sensor that senses one of temperature and humidity and being disposed within the listening area proximal to at least one of the plurality of speakers for sensing at least one environmental condition and outputting sensed data to a controller, wherein the controller adjusts at least a portion of the multi-channel audio signals to compensate for environmental changes based on the sensed data, wherein the sensor senses one of temperature and humidity; and

a detector disposed in at least one of the plurality of speakers configured for receiving a test signal originating from the controller and for reporting to the controller the test signal received by at least one of plurality of speakers, wherein the controller determines the relative positions within the listening area of the plurality of speakers based on the test signal reported by at least one of the plurality of speakers, and

wherein the controller adjusts an electrical characteristic of the multi-channel audio signals to compensate for environmental conditions in response to

the sensed data from the sensors and on the determined relative positions of the plurality of speakers in the listening area.

2. (Canceled)

3. (Canceled)

4. (Canceled)

5. (Currently Amended) The apparatus of claim 4 1, further including a memory for storing the ~~compensation~~ sensed data.

6. (Currently Amended) The apparatus of claim 5, wherein the memory ~~further~~ stores the sensed data read at the time of determination of the relative positions of the plurality of speakers.

7. (Original) The apparatus of claim 5, wherein the memory is one of a register, an SRAM, a DRAM, and a flash memory.

8. (Currently Amended) The apparatus of claim 3 1, wherein the detector is an ultrasonic detector.

9. (Currently Amended) The apparatus of claim 3 1, wherein the detector is a speaker used as a microphone.

10. (Currently Amended) The apparatus of claim 3 1, wherein the detector is a microphone.

11. (Currently Amended) The apparatus of claim 3 1, wherein the reported test signal is amplified by the amplifier prior to receipt by the controller.

12. (Canceled)

13. (Currently Amended) The apparatus of claim 3 1, wherein the sensor is disposed in each of the speakers.

14. (Canceled)

15. (Currently Amended) The apparatus of claim 3 1, wherein the sensor senses both temperature and humidity.

16. (Currently Amended) A method of controlling a plurality of speakers to play in a multi-channel audio system, wherein the plurality of speakers are arranged at respective positions within a listening area, the method comprising the steps of:

outputting from an amplifier an amplified multi-channel audio signal to be played over the plurality of speakers;

sensing by a sensor at least one environmental condition of temperature and humidity at a position within the listening area proximal to at least one of the plurality of speakers and outputting sensing data to a controller; and

~~adjusting at least a portion of the multi-channel signal to compensate for environmental changes based on the sensing data; further including determining relative positions~~ within the listening area of the plurality of speakers by:

receiving at ~~each~~ at least one speaker a test signal originating from the controller;

reporting to the controller the test signal received at ~~respective speakers~~ the at least one speaker; and

calculating relative positions of the plurality speakers based on the test signals reported by the speakers, wherein the sensor is disposed in the controller; ~~and~~

adjusting an electrical characteristic of the multi-channel audio signal to compensate for environmental conditions in response to the sensed data and on the determined relative positions of the plurality of speakers in the listening area.

17. (Currently Amended) The method of claim 16, wherein the sensor senses ~~one of~~ both temperature and humidity.

18. (Canceled)

19. (Canceled)

20. (Currently Amended) The method of claim ~~19~~ 16, further including storing in a memory the ~~compensation~~ sensing data.

21. (Original) The method of claim 20, further including storing sensing data read at the time of determination of the relative positions of the speakers.

22. (Original) The method of claim 20, wherein the memory is one of a register, an SRAM, a DRAM, and a flash memory.

23. (Currently Amended) A method of controlling a plurality of speakers to play in a multi-channel audio system, wherein the plurality of speakers are arranged at respective positions within a listening area, the method comprising the steps of:

outputting from an amplifier an amplified multi-channel audio signal to be played over the plurality of speakers;

sensing by a sensor at least one environmental condition of temperature and humidity at a position within the listening area proximal to at least one of the plurality of speakers and outputting sensing data to a controller; ~~and~~

~~adjusting at least a portion of the multi-channel signal to compensate for environmental changes based on the sensing data; further including determining relative positions within the listening area of the plurality of speakers by:~~

~~receiving at each at least one speaker a test signal originating from the controller;~~

~~reporting to the controller the test signal received at respective speakers the at least one speaker; and~~

~~calculating relative positions of the plurality of speakers based on the test signals reported by the speakers, wherein the step of receiving is performed by an ultrasonic detector; and~~

~~adjusting an electrical characteristic of the multi-channel audio signal to compensate for environmental conditions in response to the sensed data and based on the determined relative positions of the plurality of speakers in the listening area.~~

24. (Previously Presented) The method of claim 16, wherein the step of receiving is performed by a speaker used as a microphone.

25. (Previously Presented) The method of claim 16, wherein the step of receiving is by a microphone.

26. (Previously Presented) The method of claim 16, wherein the step of reporting to the controller the test signal is by wireless transmission.

27. (Previously Presented) The method of claim 23, wherein the relative position is determined based on the test signal received at a first one of the speakers and played by the first speaker and the played test signal is received by the other speakers.

28. (Previously Presented) The method of claim 23, wherein the sensor is disposed in each of the speakers.

29. (Previously Presented) The method of claim 16, wherein the sensor is disposed in the controller.

30. (Currently Amended) The method of claim 23, wherein the sensor senses ~~one of~~ both temperature and humidity.

31. (Currently Amended) An apparatus for controlling a plurality of speakers arranged at respective positions within a listening area, comprising:  
an amplifier for amplifying and outputting a multi-channel audio signal to be played over the speakers;  
at least one sensor that senses an environment condition within the listening area and outputs sensed data; and  
and a controller for originating a test signal for receipt by a detector at each of the plurality of speakers and for receiving return signals from each

speaker, the return signals representing signals as received at each respective speaker in response to the test signal from a first speaker, said controller for determining relative positions of the plurality of speakers based on the return signals and for generating compensation data based on the sensed data from the sensor and the relative positions of the speakers, wherein the compensation data is used for adjusting at least one electrical characteristic of the multi-channel audio signal, wherein the detector is an ultrasonic detector.

32. (Original) The apparatus of claim 31, further including a detector disposed in each speaker for receiving the test signal.

33. (Previously Presented) The apparatus of claim 37, wherein the detector is an ultrasonic detector.

34. (Previously Presented) The apparatus of claim 37, wherein the detector is a speaker used as a microphone.

35. (Previously Presented) The apparatus of claim 37, wherein the detector is a microphone.

36. (Canceled)



37. (Currently Amended) An apparatus for controlling a plurality of speakers arranged at respective positions within a listening area, comprising:

an amplifier for amplifying and outputting a multi-channel audio signal to be played over the speakers;

a sensor that senses an environmental condition in the listening area being located proximal one of the plurality of speakers and that outputs sensing data; and

~~and a controller for originating a test signal for receipt by the plurality of speakers and for receiving return signals from each speaker, the return signals representing signals as received at each respective speaker in response to the test signal from a first speaker, said controller for determining relative positions of the speakers based on the return signals and for generating compensation data based on the relative positions of the speakers; further including at least one sensor disposed proximal to at least one of the speakers for sensing at least one environmental condition and outputting sensing data to the controller, wherein the controller adjusts an electrical characteristic the play multi-channel audio signal to compensate for environmental changes~~ conditions based on the determined relative positions of the plurality of speakers and the sensing data, wherein the sensor senses the environmental conditions as one of temperature and humidity.

38. (Currently Amended) The apparatus of claim 31, further including a memory for storing the ~~compensation~~ sensing data.

39. (Original) The apparatus of claim 38, wherein the memory is one of a register, an SRAM, a DRAM, and a flash memory.

40. (Original) The apparatus of claim 31, wherein the relative position is determined based on the test signal received at a first one of the speakers and played by the first speaker and the played test signal is received by the other speakers.

41. (Original) The apparatus of claim 36, wherein the sensor is disposed in each of the speakers.

42. (Original) The apparatus of claim 36, wherein the sensor is disposed in the controller.

43. (Currently Amended) An apparatus for controlling a plurality of speakers arranged at relative positions in a listening area to play in a multi-channel audio system, comprising:

an amplifier for amplifying multi-channel audio signals to be played over the plurality of speakers;

at least one sensor disposed proximal to at least one of the speakers for sensing at least one environmental condition and outputting sensed data to a controller, ~~wherein the controller adjusts at least a portion of the multi-channel~~

~~audio signals to compensate for environmental changes based on the sensed data; and~~

a an ultrasonic detector disposed in each of the speakers configured for receiving a test signal originating from the controller and for reporting to the controller the test signal received at respective speakers, wherein the controller determines the relative positions of plurality of the speakers based on the test signals reported by the speakers, and wherein the ~~detector is an ultrasonic detector.~~ controller adjusts electrical characteristics of the multi-channel audio signal to compensate for the environmental condition based on the sensed data and the determined relative positions of the plurality of speakers.

44. (Previously Presented) An apparatus for controlling a plurality of speakers, comprising:

an amplifier for amplifying and outputting a multi-channel signal to be played over the speakers;

and a controller for originating a test signal for receipt by the plurality of speakers and for receiving return signals from each speaker, the return signals representing signals as received at each respective speaker in response to the test signal from a first speaker, said controller for determining relative positions of the speakers based on the return signals and for generating compensation data based on the relative positions of the speakers, wherein the compensation data is used for adjusting the multi-channel signal; and

at least one of the speakers for sensing at least one environmental condition and outputting sensing data to the controller, wherein the controller adjusts the play signal to compensate for environmental changes based on the sensing data, wherein the sensor is disposed in the controller.